

#### **D. REMARKS/ARGUMENTS**

##### **1. Rejection of Claims 18-23 Under 35 U.S.C. § 102(b)**

Claims 18-23 stand rejected under 35 U.S.C. § 102(b) as being unpatentable over U.S. Pat. No. 6,170,220 to Moore ("Moore").

In response, Applicant has amended independent claim 18. Applicant respectfully submits that, for the reasons discussed below: 1) independent claim 18, as currently amended, is not unpatentable over Moore; and 2) claims 19-23, which now depend on amended independent claim 18, are also not unpatentable over Moore.

In particular, claim 18 has been amended to recite that each rim include a plurality of separate layers of a rim material, stacked on top of one another. Claim 18 has further been amended to recite that the filler between the rims include a plurality of separate layers of a filler material different from the rim material.

No new material is introduced by these amendments to claim 18. Support for these amendments can be found throughout Applicant's specification, including but not limited to:

- paragraph [0055] ("... The collective effect is to create a wall 207 consisting of a stacked set of separately-extruded layers.")
- paragraph [0061] ("... This approach may cause an exterior rim layer 405 and an interior rim layer 407 of material to be extruded.")
- paragraph [0063] ("... As shown in FIG. 4(b) another rim layer may be extruded on top of the rim layer that has hardened. This may consist of a second exterior rim 413 being extruded on top of the first exterior rim 405 and a second interior rim 415 being extruded on top of the first interior rim 407. A first filler layer 411 may also be extruded between the first rim layers 405 and 407 by extruding material from the central nozzle 307 at the same time that the second rim layers 413 and 415 are being extruded. The filler may be of a much stronger material, such as cement. The filler material may or may not dry as quickly as rim material.")

- paragraph [0065] (“ . . . FIG. 4(c) illustrates the wall 403 with six layers. After the last needed rim layers are extruded, the next pass may extrude only a filler layer, thus completing the wall structure.”)
- FIG. 5 (illustrates the wall as a layered structure including a plurality of separate layers, stacked on top of each other)

#### Amended Claim 18

Independent claim 18, as currently amended, is reproduced below:

18. (currently amended) A wall comprising:

a set of spaced apart rims, wherein each rim includes:  
a plurality of separate layers of a rim material, stacked on top of one another;  
and

a filler between the rims, the filler including:  
a plurality of separate layers of a filler material, the filler material different from the rim material.

Applicant submits that, in contrast to what is recited in Applicant's amended claim 18 above, the Moore document does not teach or suggest any spaced apart rims wherein each rim includes a plurality of separate layers of a rim material, which are stacked on top of one another. The Moore document also does not teach or suggest any filler between the rims that includes a plurality of separate layers of a filler material different from the rim material.

In contrast, as described below, Moore teaches side panels, which are integral units, formed of single blocks of material (preferably polystyrene), and which are un-layered structures that do not include any plurality of separate layers stacked on top of one another. This is easily seen from the figures in Moore (see e.g. FIG. 1, FIG. 2, FIG. 2A, FIG. 5A, FIG. 3, and FIG. 5), as well from the relevant descriptions in Moore, as

explained in detail below. Further, Moore does not teach or suggest any filler that includes a plurality of separate layers of a filler material.

Moore thus teaches a structure very different from what is recited in amended claim 18, and in fact teaches away from amended claim 18.

In particular, Applicant submits that at least the following limitations of claim 18, as currently amended, cannot be found in the Moore document:

- a) a set of spaced apart rims, wherein each rim includes a plurality of separate layers of a rim material, stacked on top of one another;  
and
- b) a filler between the rims, the filler including a plurality of separate layers of a filler material.

Limitation a)

The descriptions (reproduced below) in Moore show that Moore neither teaches nor suggests any set of spaced apart rims, each rim including a plurality of separate layers stacked on top of one another. Rather, the side panels described in Moore are simply discrete pieces of polystyrene. Each side panel consists of a single block of polystyrene, and does not include any plurality of separate layers stacked on top of one another. As explained before, the side panels in Moore are integral, unlayered units formed of single blocks of materials (preferably polystyrene). See e.g.:

A first embodiment of the present invention . . . comprises at least two opposed **longitudinally-extending side panels 20**, . . . .

. . .

**Each side panel 20 has, a top end 24, a bottom end 26, a first end 28, a second end 30, an exterior surface 32, and an interior surface 34.** The presently preferred **side panel 20** has a thickness (separation between **the interior surface 34 and the exterior surface 32**) of approximately two and a half (21/2) inches . . . .

. . .

Referring now to FIGS. 1 and 2, **the interior surface 34 of one side panel 20 faces the interior surface 34 of another side panel 20** . . .

...

The side panels 20 are preferably constructed of polystyrene, specifically expanded polystyrene ("EPS"), which provides thermal insulation and sufficient strength . . .

Moore document, col. 3, lines 3-5, 13-18, 25-26, and 41-44.

Note from the above that Moore describes each side panel as having a top, a bottom, an interior surface, and an exterior surface. As seen from the quotations above, and as seen from the figures in Moore, the side-panels in Moore do not include any plurality of separate layers, each stacked on top of one another. Each side panel in Moore has a single interior (and exterior) surface, not a plurality of interior (and exterior) surfaces of respective layers. The figures clearly show a single smooth interior and exterior surface of each side panel (see e.g. FIG. 1, FIG. 2, and FIG. 2A), in contrast to showing a layered structure having plurality of separate interior and exterior surfaces of separate layers. FIG.s 1, 2, and 2A of Moore, with their single smooth surfaces of the side panels, can be contrasted with FIG. 5 of Applicant's application, which shows Applicant's wall as being a layered structure, including a plurality of separate layers (with respective interior and exterior surfaces), each stacked on top of each other.

#### Limitation b)

Regarding limitation b), nowhere in Moore is there any teaching or suggestion of any filler between the rims, the filler including a plurality of separate layers of a filler material. In contrast, Moore teaches that concrete, in its fluid state, is poured into a cavity formed between opposed interior surfaces of side panels made of polystyrene.

Moore states inter alia as follows:

As shown in FIG. 2A, concrete C is poured between the side panels 20 so that it bonds with the side panels 20 and the web members 40.

...

. . . the interior surface 34 of one side panel 20 faces the interior surface 34 of another side panel 20 . . . and the opposed interior surfaces 34 are

laterally spaced apart from each other a desired separation distance so that a cavity 38 is formed therebetween. **Concrete – in its fluid state – is poured into the cavity 38 and allowed to cure (i.e., harden) therein .**

Moore col. 3, lines 6-8, and lines 25-32.

In contrast to the requirement in amended claim 18 of a plurality of separate layers of a filler material, Moore teaches that fluid-state concrete is simply poured between two panels. Nowhere in Moore is there any teaching or suggestion of any plurality of separate layers of a filler material.

A document anticipates a claim only if the document discloses all the elements and limitations of the claim. If even one element or limitation of the claim is missing, a § 102 rejection fails. See e.g. Kalman v. Kimberly-Clark, 713 F.2d 760, 771, 218 U.S.P.Q. 781 (Fed. Cir. 1983). Also, anticipation requires the disclosure in a single document of each element of the claim under consideration. In re Dillon, 919 F.2d 688, 16 USPQ2d 1897, 1908 (Fed. Cir. 1990) (en banc), cert. denied, 500 U.S. 904 (1991).

Applicant respectfully submits that, by amending claim 18 to add the limitations that each rim include a plurality of separate layers of a rim material, stacked on top of one another, and that the filler include a plurality of separate layers of a filler material, the Examiner's rejections to claim 18 have been overcome. Applicant submits that Moore does not anticipate the invention as recited in amended independent claim 18, because Moore does not teach or suggest at least limitations a) and b) of claim 18, discussed above.

Applicant therefore submits that amended claim 18 is allowable, and respectfully requests that the 35 U.S.C. 102(b) rejection of claim 18 be withdrawn.

#### Claims 19-23

Claims 19-23 depend on claim 18, and therefore include all the limitations of claim 18. For all the reasons discussed above, amended claim 18 is not anticipated by

the Moore document under 35 U.S.C. § 102 (b). It follows that claims 19-23 (all depending from claim 18) also are not anticipated by Moore under 35 U.S.C. §102(b).

**2. Rejection of Claims 1-2 and 8-10 Under 35 U.S.C. § 102(b)**

Claims 1-2 and 8-10 stand rejected under 35 U.S.C. § 102(b) as being unpatentable over U.S. Pat. No. 6,103,161 to Lopez ("Lopez").

In response, Applicant has amended independent claim 1. Applicant respectfully submits that, for the reasons discussed below: 1) independent claim 1, as currently amended, is not unpatentable over Lopez; and 2) claims 2 and 8-10, which now depend on amended independent claim 1, are also not unpatentable over Lopez.

In particular, claim 1 has been amended to recite that the first and second nozzles are configured to extrude a first material, and that the third nozzle (having a third outlet between the first and second outlets) is configured to extrude a second material different from the first material. Claim 1 has further been amended to recite a valve controller configured to regulate the extrusion by the first, second, and third nozzles of their respective materials, so as to allow, during a first time period, extrusion of the first material by the first and second nozzles while not allowing any extrusion of the second material by the third nozzle, then to allow, during a second time period, extrusion of the first material by the first and second nozzles.

No new material is introduced by these amendments to claim 1. Support for these amendments can be found throughout Applicant's specification, including but not limited to the paragraphs quoted below.

Specifically, the valve controller is disclosed in paragraphs [0076] and [0077]:  
- paragraph [0076] ("... **A servo motor 1025 may be used to control an internal gate valve (not shown) that is used to regulate the flow of material to the exterior nozzle 1003. Similarly, a servo motor 1023 may be used to control an internal gate valve (not shown) that is used to regulate the flow of material to the interior nozzle 1007. The flow of material to the central nozzle 1011 may also be regulated in a similar or different manner.**")

- paragraph [0077] (“ When making a curved wall, the rim material delivery rate may be different for the exterior and interior outlets. This may be effectuated by appropriate settings of the servo motors 1023 and 1025. The valve may be near or away from the nozzle. The gate valves may be configured to controllably adjust the volume of flow, as well as to completely cut the flow off.”)

Also, the following paragraphs describe how at certain times, only two of the three nozzles are allowed to extrude material (paragraphs [0060]- [0061]), and how at other times, all three nozzles are allowed to extrude material (paragraph [0063])”

- paragraph [0060] (“As shown in FIG. 4(a), a first layer of a wall 403 may be extruded by moving the nozzle assembly 301 in a horizontal direction and **by extruding material only through the exterior nozzle 303 and the interior nozzle 305. During this pass, no material may be extruded from the central nozzle 307.**”)

- paragraph [0061] (“This approach may cause an exterior rim layer 405 and an interior rim layer 407 of material to be extruded. Since no material is being extruded during this pass from the central nozzle 307, no significant force will be placed on the interior walls of the rim layers 405 and 407.”)

- [0063] As shown in FIG. 4(b) another rim layer may be extruded on top of the rim layer that has hardened. This may consist of a second exterior rim 413 being extruded on top of the first exterior rim 405 and a second interior rim 415 being extruded on top of the first interior rim 407. A first filler layer 411 may also be extruded between the first rim layers 405 and 407 **by extruding material from the central nozzle 307 at the same time that the second rim layers 413 and 415 are being extruded.** The filler may be of a much stronger material, such as cement. The filler material may or may not dry as quickly as rim material.

### Amended Claim 1

Amended independent claim 1 is reproduced below:

A multi-nozzle assembly comprising:

- a first nozzle configured to extrude a first material through a first outlet;
- a second nozzle configured to extrude the first material through a second outlet;
- a third nozzle configured to extrude a second material different from the first material through a third outlet, the third outlet being between the first and second outlets; and
- a valve controller configured to regulate the extrusion by the first, second, and third nozzles so as to allow, during a first time period, extrusion of the first material by the first and second nozzles while not allowing any extrusion of the second material by the third nozzle, then to allow, during a second time period, extrusion of the first material by the first and second nozzles as well as extrusion of the second material by the third nozzle.

Applicant submits that the Lopez document does not teach or suggest at least the following limitations of independent claim 1 above:

- a third nozzle configured to extrude a second material different from the first material through a third outlet, the third outlet being between the first and second outlets and
- a valve controller configured to regulate the extrusion by the first, second, and third nozzles so as to allow, during a first time period, extrusion of the first material by the first and second nozzles while not allowing any extrusion of the second material by the third nozzle, then to allow, during a second time period, extrusion of the first material by the first and second nozzles as well as extrusion of the second material by the third nozzle.



In contrast to the limitations above, the Lopez document teaches the creation of thin sheets, which are pulled by a roller pair at processing time, and wherein the sheet is formed by “**simultaneously extruding the three layers forming it**, employing a plurality of extrusion material conducts in one single extrusion head.” See Lopez Abstract, lines 6-7. See also:

Concerning FIG. 1 of the drawings, it should be pointed out that the fact that the conducts associated to the extrusion it must be clearly understood that **all these conducts are assembled together in a single extrusion head**, as the one shown in FIG. 8, so that, as stated above, **the supply of extrusion material for the various sheet layers is simultaneous**, at points separated from one another by a minimal distance.

Lopez Col. 4, lines 50-58; Col. 4, line 66 – Col. 5 line 8.

Nowhere in Lopez is there any teaching or suggestion of a multi-nozzle assembly including first, second, and third nozzles, where third nozzle configured to extrude a second material different from the first material through a third outlet, the third outlet being between the first and second outlets. Also, nowhere in Lopez is there any teaching or suggestion of any valve controller configured to regulate the extrusion by the first, second, and third nozzles so as to allow, during a first time period, extrusion of the first material by the first and second nozzles while not allowing any extrusion of the second material by the third nozzle, then to allow, during a second time period, extrusion of the first material by the first and second nozzles as well as extrusion of the second material by the third nozzle.

On the contrary, Lopez teaches away from amended claim 1, by teaching that all three nozzles work simultaneously. See e.g. Lopez Abstract lines 5-7 (“ . . . the sheet being formed by **simultaneously extruding the three layers forming it . . .**”). See e.g. Tec Air, Inc. v. Denso Mfg. Mich. Inc., 192 F.3d 1353, 1360, 52 USPQ2d 1294, 1298 (Fed. Cir. 1999): “A reference may be said to teach away when a person of ordinary skill, upon reading the reference, . . . would be led in a direction divergent from the path that was taken by the applicant.” (emphasis added).

As mentioned above, a document anticipates a claim only if the document discloses all the elements and limitations of the claim, and each element of the claim under consideration must be disclosed in a single document.

Applicant respectfully submits that, for all of the reasons discussed above, independent claim 1, as currently amended, is not anticipated by Lopez.

### Claims 2, 8-10

Claims 2 and 8-10 depend on claim 1, and therefore include all the limitations of claim 1. For all the reasons discussed above, claim 1 is not anticipated under 35 U.S.C. § 102 (b) by the Lopez document. It follows that claims 2 and 8-10 (all depending from claim 1) also are not anticipated by Lopez under 35 U.S.C. §102(b).

### **3. Rejection of Claims 1, 3, and 6-11 Under 35 U.S.C. § 102(b)**

Claims 1, 3, and 6-11 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Pat. No.5,059,266 to Yamane ("Yamane").

Applicant respectfully submits that, for the reasons discussed below:

1) independent claim 1, as currently amended, is not unpatentable over Yamane; and 2) claims 3 and 6-11, which now depend on amended independent claim 1, are also not unpatentable over Yamane.

Yamane teaches ink jet heads, which spray ink. In particular, Yamane teaches the jetting of photosetting resin by ink jet heads, to print a matrix of dots to create various colors. Yamane does not relate to a multi-nozzle assembly, which 1) has a third nozzle between a first nozzle and a second nozzle, the first and second nozzles configured to extrude a material different from the material extruded by the first and second nozzles, and which 2) includes a valve controller that regulates the extrusion by the first, second, and third nozzles of their respective materials in the manner recited in amended claim 1.

In particular, Yamane does not teach or suggest at least the following limitations of amended claim 1:

- a third nozzle configured to extrude a second material different from the first material through a third outlet, the third outlet being between the first and second outlets and
- a valve controller configured to regulate the extrusion by the first, second, and third nozzles so as to allow, during a first time period, extrusion of the first material by the first and second nozzles while not allowing any extrusion of the second material by the third nozzle, then to allow, during a second time period, extrusion of the first material by the first and second nozzles as well as extrusion of the second material by the third nozzle.

Nowhere in Yamane is there any teaching or suggestion of first, second, and third nozzles, where the third nozzle is configured to extrude a second material different from the first material through a third outlet that is between a first outlet (of the first nozzle) and a second outlet (of the second nozzle).

Also, nowhere in Yamane there any teaching or suggestion of any valve controller configured to regulate the extrusion by the first, second, and third nozzles so as to allow, during a first time period, extrusion of the first material by the first and second nozzles while not allowing any extrusion of the second material by the third nozzle, then to allow, during a second time period, extrusion of the first material by the first and second nozzles as well as extrusion of the second material by the third nozzle.

As explained above, a document anticipates a claim only if the document discloses all the elements and limitations of the claim.

Applicant respectfully submits that Yamane therefore does not anticipate the invention as recited in claim 1, as currently amended. Applicant respectfully requests that the 35 U.S.C. 102(b) rejection of claim 1 be withdrawn.

#### Claims 3, 6-11

Claims 3 and 6-11 depend on claim 1, and therefore include all the limitations of amended claim 1. For all the reasons discussed above, amended claim 1 is not anticipated under 35 U.S.C. § 102 (b) by the Yamane document. It follows that claims 3 and 6-11 (all depending from amended claim 1) also are not anticipated by Yamane under 35 U.S.C. §102(b).

#### **4. Rejection of Claims 1-2, 4-5, and 8 Under PCT Article 33(2)**

Claims 1-2, 4-5, and 8 stand rejected under 35 U.S.C. 102(b) as being anticipated by King et al (4,055,623)("King").

Applicant respectfully submits that, for the reasons discussed below:

- 1) independent claim 1, as currently amended, is not unpatentable over King; and
- 2) claims 2, 4-5, and 8, which now depend on amended independent claim 1, are also not unpatentable over King.

King relates to the extrusion of sheets, not to extrusion of a structure having a multitude of layers, in contrast to Applicant's application. In particular, King does not relate to any multi-nozzle assembly, which 1) has first, second, and third nozzles, the third nozzle between the first and second nozzles and configured to extrude a material different from the material extruded through the first and second nozzles, and which 2) includes a valve controller that regulates the extrusion by the first, second, and third nozzles of their respective materials in the manner recited in amended claim 1.

In particular, King does not teach or suggest at least the following limitations of amended claim 1:

- a third nozzle configured to extrude a second material different from the first material through a third outlet, the third outlet being between the first and second outlets  
and
- a valve controller configured to regulate the extrusion by the first, second, and third nozzles so as to allow, during a first time period, extrusion of the first material by

the first and second nozzles while not allowing any extrusion of the second material by the third nozzle, then to allow, during a second time period, extrusion of the first material by the first and second nozzles as well as extrusion of the second material by the third nozzle.

Nowhere in King is there any teaching or suggestion of first, second, and third nozzles, where the third nozzle is configured to extrude a second material different from the first material through a third outlet that is between the first outlet (of the first nozzle) and the second outlet (of the second nozzle). Also, nowhere in King is there any teaching or suggestion of any valve controller configured to regulate the extrusion by the first, second, and third nozzles so as to allow, during a first time period, extrusion of the first material by the first and second nozzles while not allowing any extrusion of the second material by the third nozzle, then to allow, during a second time period, extrusion of the first material by the first and second nozzles as well as extrusion of the second material by the third nozzle.

As mentioned above, a document anticipates a claim only if the document discloses all the elements and limitations of the claim.

Applicant respectfully submits that, for reasons set forth above, King does not anticipate the invention as recited in amended claim 1. Applicant respectfully requests that claim 1, as currently amended, is now allowable.

#### Claims 2, 4-5, and 8

Claims 2, 4-5, and 8 now depend on amended claim 1, and therefore include all the limitations of amended claim 1. For all the reasons discussed above, amended claim 1 is not anticipated under 35 U.S.C. § 102 (b) by the King document. It follows that claims 2, 4-5, and 8 (all depending from amended claim 1) also are not anticipated by King under 35 U.S.C. §102(b).

#### **5. Allowed Claims**

Applicant notes with appreciation that claims 12-17 have been allowed.

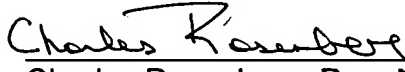
6. **Conclusion**

On the basis of the foregoing amendments, Applicant respectfully submits that all of the pending claims 1-23, including 1-11 and 18-23 as well as allowed claims 12-17, are now in condition for allowance. An early and favorable action is therefore earnestly solicited.

The Commissioner is hereby authorized to charge the one-month extension fee (\$60) and the Request for Continued Examination fee (\$395) to Applicant's Attorney's deposit account 501946 and reference attorney docket number 28080-115.

Respectfully submitted,

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